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Governor
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Division Director

State of Utah

DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

355 West North Temple
3 Triad Center, Suite 350
Salt Lake City, Utah 84180-1203
801-538-5340

March 27, 1992

Mr. Allen Childs
Genwal Coal Company, Inc.
P. O. Box 1201
Huntington, Utah 84528

Dear Mr. Childs:

Re: **Division Order, Proposed Mine Sequence Changes, Genwal Coal Company, Crandall Canyon Mine, ACT/015/032, Emery County, Utah**

The enclosed Division Order and technical review are in response to the proposed information submitted by Genwal Coal Company on November 19, 1992. Information included in that response was also the determination for abatement of Notice of Violation N91-13-1-1.

Deficiencies in that proposal must be resolved as specified in the technical review by Randy Harden, dated March 26, 1992 and within the time specified in the attached Division Order.

Should you have any questions regarding the Division Order or the deficiencies found in the technical review, please do not hesitate to call.

Sincerely,

Daron R. Haddock

Daron R. Haddock
Permit Supervisor

Enclosures
cc: R. Harden
BT015032.DOA

STATE OF UTAH
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

PERMITTEE	DIVISION ORDER AND FINDINGS of PERMIT DEFICIENCY
Mr. Allen Childs Genwal Coal Company, Inc. P. O. Box 1201 Huntington, Utah 84528 Crandall Canyon Mine Emery County, Utah Permit Number ACT/015/032 Division Order # 92A	

PURSUANT to R645-303-212, the DIVISION hereby ORDERS the PERMITTEE, Genwal Coal Company to make the permit changes enumerated in the FINDINGS OF PERMIT DEFICIENCY in order to be in compliance with the State Coal Program. These Findings of Permit Deficiency are to be remedied in accordance with the requirements of R645-303-220.

FINDINGS OF PERMIT DEFICIENCY

Based on a review of Genwal Coal Company's MRP on March 26, 1992, information in the current plan and proposed changes to the MRP do not adequately address all of the regulatory requirements. (See March 26, 1992 Technical Review memo by Randy Harden.) Genwal Coal Company will be required to correct the permit defects and demonstrate

compliance with R645-301-521.140; R645-301-622; R645-301-522; R645-301-523; and, R645-301-525.100.

ORDER

It is hereby ORDERED that Genwal Coal Company make the requisite permit changes in accordance with R645-303-220 and submit a complete application for permit change, addressing the FINDINGS OF PERMIT DEFICIENCY by no later than April 16, 1992.

So ORDERED, this 27th day of March, 1992, by the Division of Oil, Gas and Mining.

Dianne R. Nielson, Director
Division of Oil, Gas and Mining

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March 26, 1992

TO: Daron Haddock, Permit Supervisor

FROM: Randy Harden, Sr. Reclamation Engineer

RE: **Proposed Mine Sequence Changes, Genwal Coal Company, Crandall Canyon Mine, ACT/015/032-91D, Emery County Utah.**

SUMMARY

On November 19, 1991, Genwal Coal Company submitted a proposal to update information in Chapter 14 of their Mining and Reclamation Plan. Those changes dealt primarily with the reduction in the angle of draw for the area from 30 degrees to 15 degrees, and the request to conduct second mining activities within the buffer zone area between the State leases and the Forest Service boundaries. Information regarding the sequence and timing of the underground mining operations and the failure to conduct those mining operations in accordance with the approved plan resulted in NOV 91-13-1-1.

A deficiency review of that information resulted in a second submittal by the Operator which was received by the Division on January 14, 1992, followed by a third submittal by Genwal on January 30, 1992. This revised proposal calls for reorientation of production panels as well as further information on the angle of draw now proposed at 20 degrees. The following is a review of that information.

ANALYSIS

R645-300-121. Filing and Public Notice.

Proposal:

The Operator has provided a copy of the previous affidavit of publication for the state lease modifications which were approved by the Division in 1991. Additionally, a draft copy of the public notice for the Significant Permit Revision is also provided in

the proposal. Finally an Affidavit of Publication was received by the Division in the January 14, 1992 submittal of revised information.

Analysis:

The addition of this surface buffer zone to the permit area constitutes issuance of a permit for that area as required under R645-303-200. Consequently, the change to the permit constitutes a Significant Permit Revision.

The initial submittal of the proposed changes to the plan was considered administratively complete on December 23, 1991 by the Division. The affidavit of Publication completes the requirements of this section of the regulations.

Deficiencies:

None.

R645-301-521.140. Mine Maps and Permit Area Maps.

Proposal:

The revised proposal to the Mining and Reclamation Plan calls for reorientation of the production panels in State leases ML-21569 (T15S R6E all of SEC 36) and ML-21568 (T16S R7E all of SEC 2) from a north/south to an east/west orientation.

The proposed extension to the permit area would incorporate not only the subsidence areas around the above two state leases, but also extend the permit areas adjacent to all other coal leases found within the existing permit area.

This surface buffer zone has been added to project subsidence from the current mine permit area into adjacent U.S. Forest Service surface areas. This surface buffer zone is proposed for surface use only and no underground mine workings will project into that area. This surface buffer zone area encompasses an additional 2,140 acres into the permit area.

Mine projections and the extent of the proposed permit boundary changes are shown on Plate 3-3 of the proposal.

Analysis:

Under the requirements of R645-301-521.140. **Mine Maps and Permit Area Maps,** the Operator must provide: The boundaries of all areas proposed to be affected over the estimated total life of the coal mining and reclamation operations, with a description of size, sequence and timing of the mining of subareas for which it is anticipated that additional permits will be sought; the coal mining and reclamation operations to be conducted, **the lands to be affected throughout the operation,** and any change in a facility or feature to be caused by the proposed operations; and, **the underground workings and the location and extent of areas in which planned-subsidence mining methods will be used and which includes all areas where the measures will be taken to prevent, control, or minimize subsidence and subsidence-related damage** (refer to R645-301-525).

Information found in the November 19, 1991 submittal clearly indicated that the underground sequence and the timing of the mining subareas had been substantially altered from the maps and designs submitted on June 21, 1991 which were subsequently approved by the Division.

First mining, and more importantly, second mining of the first right panel of State lease ML-21569 should not have occurred without a more thorough determination of the influence due to subsidence in that panel. Obviously, the first right panel area should have been left unmined as indicated on Plate 14-1 of the June 21, 1991 submittal. Upon acquisition of the federal lease area immediately to the west of the state lease, the Operator could have efficiently second-mined the first right panel without having to contend with the problem of having the permit boundary adjacent to the first right panel. Failure to permit the area adjacent to the state lease prior to mining this first right panel appears to be a matter of poor judgement in mining sequencing and inadequate permit area planning by the Operator.

Based on the information presented in November 19, 1991 submittal, the proposed changes to the Mining and Reclamation Plan, insufficient information was present to allow second mining of the first right panel of State lease ML-21569. The Operator was required to submit more detailed designs within that area to demonstrate that second mining could occur in that panel while minimizing or eliminating the effects of subsidence outside the permit area. Alternately, prior to conducting second mining operations of this panel, the Operator could incorporate the potential area to be affected by the second mining of this panel into the permit area.

A revised underground mining layout is proposed in the January 30, 1992 submittal. The production panel as described in the November 19, 1991 submittal has been altered to

now become the 1ST RIGHT bleeder for ML-21569 and 9 panels have been reoriented within the lease to run east to west rather than north to south as in the originally approved plan.

Reorientation of the mining panels has resulted in what the Operator believes to be a more efficient method for coal recovery within the state lease. This reorientation more closely parallels the perennial steam channels above the mine workings and would reduce the number of mine panels that would be impacted by first mining activity only under the stream channels within the stream channel buffer zone areas.

In addition to the reorientation of the mine workings, the Operator has proposed the addition of permit area as a buffer zone around the coal lease boundaries. This buffer zone is intended to incorporate all of the potential effects of subsidence within the permit area. This buffer zone is shown on Plate 3-3.

Deficiencies:

1. Mine maps and permit area maps which are currently part of the Mining and Reclamation Plan have not been updated to reflect the proposed changes to the underground mining operations as well as the additional permit area. The Operator must, upon approval of the proposal, revise all maps and drawings to adequately reflect those changes throughout the plan.

R645-301-622. Cross-Sections, Maps and Plans.

Proposal:

The Operator has provided Plate 3-3 to show the proposed mining projections.

The Operator has indicated that mining of the state leases will occur in the Hiawatha seam and that based on present drill hole information, other seams within the lease area are considered unmineable. Up holes will be drilled to a maximum of 150 feet in an attempt to locate and evaluate the Blind Canyon and the Bear Canyon seams.

Analysis:

The Operator has not adequately characterized the geology of the state leases with regard to identification of other coal or rider seams that may be present within the lease area.

At a minimum, the elevations and locations of test borings and core samplings; nature, depth, and thickness of the coal seams to be mined, any coal or rider seams above the seam to be mined, each stratum of the overburden, and the stratum immediately below the lowest coal seam to be mined; all coal crop lines and the strike and dip of the coal to be mined within the proposed permit area must be provided in the plan.

No discussion of the rider seams within the state leases other than a commitment to drill up holes into them was found within the text of Chapter 14. The Operator has not adequately discussed the location and the potential mineability of these other coal seams in the proposal. Information on the interburden between these seams, their estimated thickness and other information as enumerated above must be incorporated into the text of the proposal and adequately shown on maps and cross-sections.

The Operator should also characterize the potential mineability of these seams. Such information as the interburden between the seams, their thickness, or coal quality may be considered as factors in determining whether or not the seams are considered mineable.

1. **Prior to permit approval,** the Operator must submit more detailed maps showing the layout and sequence of underground mining activities. At a minimum, the following shall be provided:

    a. Plate 14-1 shall be revised and replaced to show the mine layout for the state leases.
    b. Maps showing the sequence and timing of the mining operations projected on an annual basis for at least 5 years, and the extent of the mine workings for the life of the mining operations.
    c. Plate 14-1 and the mine layout for all other existing and proposed mine workings shall show the overburden contours. These contours shall be protected over the entire permit area (not just the lease area) and shall be at a minimum contour interval of 100 feet and a map scale of 1"=500'.
    d. Plate 14-1 and the mine layout for all other existing and proposed mine workings shall show the locations in which second mining is to occur and will show the buffer zones in which no second mining will occur.
    e. Plate 14-1 and the mine layout for all other existing and proposed mine workings shall show the locations of all perennial and intermittent streams, roads, and any renewable resources as defined under the regulations within the permit area.

f. A map showing the extent of the area proposed to be affected by planned subsidence. This map shall clearly delineate the subsidence area projected and the areas to be second mined. Any surface features or structures which are to be protected must also be clearly identified on the drawing.

2. Maps and cross-sections indicating the location and extent of all coal seams should be presented in the plan with sufficient detail so as to determine their potential mineability. In those areas where the Operator has committed to accomplish additional drillhole information, the tentative locations of these holes, and the type of data to be collected from these holes should be characterized.

R645-301-522. Coal Recovery.

Proposal:

The Operator's proposal regarding coal recovery indicates that of the in-place reserves of 18 million tons, 8 million tons will be recovered. This is identical to the originally approved plan for the state lease modifications.

The Operator has noted that, based on existing drill hole information, the possibility of multiple seam mining was excluded. However, Genwal has committed to provide up holes in an attempt to locate and identify the Blind Canyon and the Bear Canyon seam from the Hiawatha seam. Should, in the unlikely event that a mineable seam be found above the Hiawatha seam, it will be evaluated for potential mining prior to conducting any second mining of the Hiawatha seam. This drilling information will only be conducted in State lease ML-21568 and no additional drilling information is anticipated for State lease ML-21569. This information is found on page 14-2 of the revised proposal.

Analysis:

The Operator must discuss the location, thickness and mining potential for the Bear Canyon and Blind Canyon seams as well as the Hiawatha seam. Additionally, any other identifiable rider seams above or below the Hiawatha seam which is currently proposed to be mined.

Deficiencies:

1. The Operator must address and characterize all coal and rider seams found within the state leases.

R645-301-523. Mining Method(s).

Proposal:

In general, the Operator proposed conventional room and pillar mining methods throughout the mine area. No longwall mining operations are currently proposed for the permit area.

The Operator has proposed a 20 degree angle of draw in the most recent proposal. Information supporting this determination of the angle of draw is presented in the proposal in Appendix 14-9. This report by TerraTek is based on mine layout and orientation of the mining panels in the north/south orientation as was previously proposed by the Operator and the analysis of this report was concluded prior to the reorientation of the mining panels. In summary, the report concludes that the proposed pillar pulling scheme will result at the surface, a maximum subsidence of not more than 3 to 4 inches at approximately 240 feet inside the lease-boundary at the west end of the property. The draw angle over the intact coal is expected to be of the order of 20 degrees. The Consultant further concludes that more definitive statements of these affects supported by accurate and more realistic subsidence profiles can only be provided by conducting a detailed analysis in conjunction with laboratory tests to determine the deformational characteristics and failure behavior of the constituent layers of the rock mass.

Comments by the BLM pertaining to subsidence have also been incorporated into the proposal in Appendix 14-20, in a letter dated December 11, 1991, to Daron Haddock, at the Division. BLM comments that the currently approved angle of draw of 30 degrees is considered high for the region and that in their opinion, angles of draw should be in the 15 to 20 degree range.

The method used by the Operator to determine the maximum surface limit of possible subsidence is found in Appendix 14-17 of the proposal.

Mine pillar design has been identified by the Operator in Section 14.6.1.1 of the proposal. The Operator has proposed minimum factors of safety for pillars in main entries

and rooms at 1.5 and 1.3 respectively. Information presented in the plan indicates that the room and pillar design for the main entries meet this criteria.

Analysis:

Information presented in the proposal regarding the angle of draw reflects the general conditions and expected results of subsidence. The angle of draw anticipated through analysis and recommendations by the Operator's consultant, the BLM, National Coal Board analysis seem to indicate a range in the angle of draw between 15 and 35 degrees.

Although the information presented in the TerraTek analysis was specific to the orientation which was previously proposed and is not specific to the current proposal, the end results of that analysis would be expected to be similar. Without detailed site characterization, analysis and modeling, and without detailed data collection and analysis of subsidence within the permit area, no more definitive results of determining the angle of draw for the permit area could be expected.

Because of the depth of cover of the mining operations, and the apparent lack of adverse impact on the surface from previous mining operations it could be considered that such additional data collection would not be cost effective. If the risk of potential harm or environmental degradation as a result of mine subsidence were higher such an investigation would be warranted. Based on the information presented in the plan and the general observations of subsidence in the region, an angle of draw as proposed by the Operator of 20 degrees is considered reasonable and the information presented in the existing plan and the proposed revisions should reflect an angle of draw of 20 degrees rather than the currently approved 30 degree angle of draw.

Each application will include a description of the mining operation proposed to be conducted during the life of the mine within the proposed permit area, including, at a minimum, a narrative description of the type and method of coal mining procedures and proposed engineering techniques, anticipated annual and total production of coal, by tonnage and the major equipment to be used for all aspects of those operations.

Coal reserve information stated in the plan indicates that there is approximately 18 million tons of coal within the reserves of the state leases, of which 8 million tons are considered recoverable. This discussion needs to be expanded to consider those potential coal reserves in all of the coal seams which exist within the lease area. Annual production information also needs to be provided in the discussion of the mining operations. Sequence and timing of the mining operations must be more clearly established by the Operator.

A mine map showing the location and extent of all existing mine workings within and adjacent to the permit area needs to be provided. This map should project the sequence and timing of those subareas to be mined within the permit term. These areas should be marked, at a minimum, to show the location and the extent of the areas to be mined on an annual basis. Upon submission of this mining projection and approval of the mining map by the Division, the Operator will be required to submit to the Division, as an amendment, any changes proposed to alter the mine design or sequence **PRIOR** to making such changes and changes in the underground mining sequence and operations must be approved by the Division prior to making such changes.

Any changes in the mining plans must also address any applicable changes that may be required in the subsidence control plan and must be approved by the Division prior to implementing such changes.

Additional information submitted by the Operator does not depict the sequence and timing for mining operations within all of the permit area. The Operator still needs to submit mining maps for the entire permit area which show the sequence and the time of the subareas to be mined throughout the permit term, and the extent of the underground mining operations throughout the life of the mining operations.

Deficiencies:

1. The Operator must provide a map showing the location and the extent of the existing mine workings and the proposed mine workings for the entire permit area. This map shall show the sequence and timing of the underground mining operations on an annual basis for a minimum of five years and shall show the extent of the mine workings for the life of the mining operations. This map must be submitted by the Operator and approved by the Division prior to any subsequent changes in the mining and operation plan with regard to changes of underground mining operations.

R645-301-525.100. Subsidence Control Plan.

Proposal:

The anticipated impacts and effects from subsidence are presented in the Operator's proposal in Section 14.6.2

The Operator has projected a buffer zone to increase the permit area based on an angle of draw of 20 degrees projected from the lease area boundaries with a correction for topographic variations to determine the maximum limit of subsidence. This projection is provided in Figure 14-9. The buffer zone was added to the lease boundary and consequently the permit boundary to ensure that any anticipated subsidence beyond the lease area boundary be incorporated into the permit area.

Additionally, this delineation has been provided on Figure 14-10 to identify any potential seeps or spring which may be potentially impacted as a result of subsidence. In the event that any of these seeps or springs become adversely affected, the Operator has committed to notify the appropriate agencies and begin developing an acceptable mitigation plan. In the event that subsidence negatively impacts grazing, the Operator will compensate the owner or appropriate party by paying the fair market value for the loss experienced. Compensation will be made after the grazing loss is proven to have resulted from surface subsidence.

Additionally in Section 14.5.2.3 through 14.5.2.5, the Operator has indicated that no retreat mining will be conducted within the stream channel buffer zones of both the south and north forks of Crandall Creek, Blind Creek, and the south fork of Horse Creek until Genwal has shown what reaches of these streams are perennial, and that these reaches will not be adversely affected by mining activity. Plate 14-1 is referenced to characterize these stream buffer zones.

Stream monitoring was conducted in 1991 to determine which stream reaches exhibit perennial flow. Stream flow measurements are provided in Table 14-4.

Analysis:

Information presented in the proposal and in the current plan still does not adequately address the subsidence control plan for the buffer zones required to prevent subsidence beneath the perennial streams found within the permit area. Detailed designs and mine plans must be presented by the Operator to ensure that these areas will not be affected by mine subsidence.

Most of the Operator's subsidence control plan was submitted and reviewed by the Division with the lease modifications to add the two state leases to their Mining and Reclamation Plan. As a result of that review, the Division stipulated the following:

Stipulation R614-301-525 DWD

The applicant will not be allowed to conduct mining operations which will influence or project disturbance of landuse or surface features on U.S. Forest Service lands. The applicant will be restricted to conduct no subsidence mining operations within an angle-of-draw established at 30 degrees, from the boundaries of State Leases ML-21568 and 21569, until the Regulatory Authority either receives a letter from the Manti-Lasal National Forest granting permission to encroach on their boundaries or by receiving geotechnical data from Genwal that will allow mining at a lesser angle-of-draw.

1. The applicant will be required to develop a mine map that reflects a no mining area within a 30 degree angle-of-draw, horizontal, other than developing main entries with no second or retreat mining, along the boundaries between the State Leases and Forest Service lands. The applicant will be required to submit the map within 60 days of permit approval which identifies the no mining area.

The applicant has not identified measures to protect the stream channel in Blind Canyon, and Crandall Canyon from subsidence. The Forest Service have established water rights along the stream channel which should be protected. The applicant will be required to maintain surface configuration by retaining support pillars along the stream channel buffer zone. The buffer zone will be establish at a 30 degree angle-of draw and no secondary mining will take place in the buffer zone, until the applicant submits sufficient information to show that subsidence of those areas will not occur.

2. The applicant must submit a map and plans to protect those portions of Blind Canyon and Crandall Canyon stream channels which lie within the state leases. The applicant will be required to submit the map within 60 days of permit approval.

Information submitted in the proposal fails to identify and delineate the perennial stream channels as required by the above stipulations. No information was presented in the proposal to make a definitive location of the perennial stream channels possible. It is apparent however, that the reaches of the streams show within the subsidence buffer zones do not correspond to the water allotments which are shown on Figure 14-7 of the proposal.

It is not clear in the NEICO lease modification nor in the proposal as to whether or not the water allotments shown on Figure 14-7 need to be within stream buffer zones as

described in the approved plan. It is clear however, that the responses to the above stipulations remain inadequate. The Operator must provide a realistic projection of the areas of subsidence from second mining operations, and must delineate those reaches of perennial streams which must be protected by stream buffer zones and allow first mining operations in those areas as currently approved in the Mining and Reclamation Plan.

The exception to this however would be the reduction in the angle of draw for these areas from 30 degrees as currently approved to that of 20 degrees as presented in the Operator's most recent proposal.

Additionally, the subsidence information presented in the plan on Figures 14-9 and 14-10 remains unchanged from the original NEICO lease modifications and are projected at a 30 degree angle of draw. The Operator has not clearly indicated this difference in the proposal. These figures should be qualified in the narrative to indicate that the projections shown on these figures is for the 30 degree angle of draw and that the reduction of the draw angle to 20 degrees will limit the extent of mine subsidence to within those areas. The actual projection of the area affected by mine subsidence should be provided on the maps showing the mine working and the overburden contours as indicated in Section R645-301-622 of this review.

In Section 14.3.2.1.2 of the proposed plan, the Operator has indicated that a criteria of 50% extraction will be used within a 20 degree angle of draw. This assumption is erroneous in the fact that the basis for protection from subsidence is based on no more than a 50% Recovery Factor, and not on a 50% extraction ratio. At 50% extraction, pillars would be pulled and the panel would be allowed to cave which could result in surface subsidence beyond the angle of draw limit (the lease boundary) as indicated by the Operator on Plate 14-1.

The Operator must revise the text of the above section to more clearly indicate that pillars will not be pulled within the subsidence buffer zones established for stream channel protection. Those pillars must remain intact to effectively provide sufficient roof support to prevent subsidence from occurring in those areas. Pulling pillars or any second mining which would reduce the pillar size in those panels within the buffer zone would not prevent subsidence from occurring.

Additional information supportive of the Operator's constraints is found in the submittal cover letter dated January 14, 1992. Much of the information found in this letter helps to further justify the mining methods used by Genwal, but this information has not been incorporated into the text of the Mining and Reclamation Plan.

Deficiencies:

1. The Operator must identify and delineate perennial streams within the proposed permit area. The maps showing the locations of the perennial streams must meet the approval of the Forest Service prior to conducting any type of second mining operations within the state lease area. Once the locations of these streams has been established and approved by the Division and the Forest Service, the Operator must then project buffer zones for these perennial streams which will not allow any type of second mining within those buffer zones. These buffer zones shall be based on a 20 degree angle of draw. and methodology used in calculation of the maximum surface limit of possible subsidence which will could affect those stream buffer zones shall be based on that methodology used in appendix 14-17.

RECOMMENDATIONS

Information submitted in the proposal is considered sufficient to allow the Operator to effectively reduce the angle of draw from 30 degrees to 20 degrees. It is also apparent that the proposed increase in the permit area will successfully incorporate all areas proposed to be affected by subsidence within the permit area.

However, inadequate and incomplete information required for approval and for the initial stipulations of the NEICO lease modification remain outstanding. The Operator still needs to update all maps and drawings within the plan to articulate the changes proposed. Delineation of perennial streams and stream buffer zones for protection have yet to be adequately identified and letters of concurrence from the Forest Service and other agencies directly involved with stream protection and the protection of water rights within these areas have not been incorporated into the plan.

Mine maps and plans showing the location and extent of the mine workings, the areas of second mining and a projection of the areas which are to be subsided by second mining need to be provided by the Operator. The text of the Mining and Reclamation Plan needs to be updated to incorporate these revision to the mine plan.

Essentially, the initial information submitted by the Operator is sufficient to justify the proposed changes to the plan, but is technically inadequate to allow approval at this time.

cc: BTEAM
GENWAL.JRH